

CMC Liquid Spectrometer Commissioning

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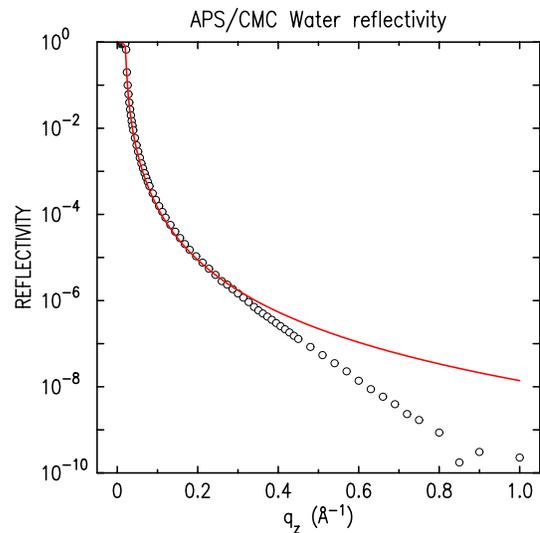
Introduction

The CMC liquid spectrometer has been successfully tested at ID 9B. The instrument, designed to be extremely versatile, is capable of anomalous reflectivity and grazing incident angle measurements from liquid surfaces. Our commissioning run, which included mechanical and software debugging, demonstrated that the instrument is well suited to the highly collimated and focused beam at the APS, and that the spectrometer is capable of working over a wide energy range with virtually no realignment. In addition, our measurements indicate excellent long-term vertical beam stability, < 0.05 mm.

Results

Initial measurements were carried out from the water surface since it is easy to prepare and provides a convenient benchmark for testing the instrument's capabilities. The reflectivity from a clean water surface, contained in a Langmuir Trough, is shown below. The present measurements extend the range of measurements from the water surface to nearly 1 \AA^{-1} , a range 30% greater than obtained at the NSLS. The red line shows the expected reflectivity from an ideally flat surface. The deviation between the ideal curve and the data is due to the roughness induced by thermally excited capillary waves. Preliminary analysis yields a

Gaussian roughness of 2.60 \AA , in agreement with measurements carried out over a lesser range.



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